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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Yang Gao

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EXAMINER

JACKSON, JAKIEDA R

ART UNIT

PAPER NUMBER

2626

MAIL DATE

DELIVERY MODE

09/30/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/799,533	Applicant(s) GAO, YANG	
	Examiner JAKIEDA R. JACKSON	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/15/08.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 13, 15, 17-27, 29, 31, 33-36, 39-43, 46, 48, 49 and 51-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13, 15, 17-27, 29, 31, 33-36, 39-43, 46, 48, 49 and 51-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. In response to the Office Action mailed May 6, 2008, Applicant submitted an amendment filed on June 10, 2008 in which the applicant traversed and requested reconsideration.

Response to Arguments

2. Applicant argues that there is no disclosure, teaching or suggestion in Kaajas about a filter cut-off frequency, or that a filter cut-off frequency of above 4 kHz is utilized for speech encoding and decoding. Applicant's arguments are persuasive, but are moot in view of new grounds of rejections. The finality of the previous office action is withdrawn in favor of a new final rejection which is made final in view of the changes to the claims in the amendment filed 2/12/08 necessitating new grounds of rejections. The Office regrets any inconvenience to applicant.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made

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to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1, 3-5, 7-11, 13, 15, 17, 19-21, 23-27, 29, 31, 33-36, 39-43, 46, 48, 51, 53 and 55** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergstrom et al. (USPN 5,809,459), hereinafter referenced as Bergstrom in view of Andersen et al. (PGPUB 20060153286), hereinafter referenced as Andersen and in view of Zinser, Jr. et al. (USPN 6,138,092), hereinafter referenced as Zinser and in further view of Tucker et al. (USPN 6,675,144), hereinafter referenced as Tucker .

Regarding **claims 1 and 17**, Bergstrom discloses a method and apparatus of processing speech comprising:

obtaining an input wideband (expand the bandwidth, paragraph 0019) speech signal (input speech; column 3, line 63 – column 4, line 24);

processing said voiced portion of said input wideband speech signal to obtain a first set of parameters using analysis by synthesis approach (analysis and synthesis processor; column 3, line 63 – column 4, line 24); and

processing said noise portion of said input wideband speech signal to obtain a second set of parameters using open loop approach (open loop; column 12, lines 5-22), but does not specifically teach decomposing said input wideband speech signal,

transmitting said first set of parameters and wherein said filter cut-off frequency is above 4kHz.

Andersen discloses a method and apparatus wherein said voiced portion is a portion of said input wideband speech signal for waveform matching and said noisy portion of said input wideband speech signal not for waveform matching (analysis-by-synthesis; paragraph 0043) , and wherein said filter cut-off frequency is above 4kHz (8kHz; paragraph 0045), to improve performance.

Zinser teaches a method wherein it transmit said first set of parameters, said second set of parameters and a voicing index to a decoder, wherein said voicing index provides filter cut-off frequency for signal decomposition (cut off frequency; column 12, line 24 – column 13, line 2), to ensure effective performance.

Tucker discloses a split-band coding method wherein said filter cut-off frequency is above 4 kHz (column 3, line 19 - column 4, line 35). In particular, Tucker discloses a method comprising lower band having cutoff frequencies at both 4 KHz and 5.5 KHz (col. 4, line 12), and states that the high-band encoder encodes at least the non-periodic (i.e., unvoiced) component (col. 3, lines 19-20), encoding speech having total bandwidth of at least 5.5 KHz (col. 4, lines 34-35), to reproduce the noise component in the upper subband.

As shown above, all the claimed elements were known in the prior art, as evidenced in the above references, and one skilled in the speech processing art could have combined the elements by merely adding them together, with no change in their respective function, and the combination would have yielded predictable results or the

sum of the respective functions, to one of ordinary skill in the art at the time of the invention, KSR International Co. v. Teleflex Inc., 550 U.S.--,82 USPQ2nd 1385 (2007).

Regarding **claims 3 and 19**, Bergstrom discloses a method and apparatus wherein said separation component is a lowpass filter (lowpass filter; column 6, lines 29-66).

Regarding **claims 4 and 20**, Bergstrom further discloses a method and apparatus, wherein bandwidth of said lowpass filter is dependent upon a characteristic of said input speech (lowpass filter; column 6, lines 29-66).

Regarding **claims 5 and 21**, Bergstrom further discloses a method and apparatus wherein said characteristic of said input speech is pitch correlation (pitch; column 6, lines 29-66).

Regarding **claims 7 and 23**, Bergstrom in view of Andersen disclose everything as claimed in claims 1 and 17. In addition, Andersen further discloses a method and apparatus wherein said analysis by synthesis approach is a Code Excited Linear Prediction (CELP) process (columns 1—2, paragraphs 0019-0022).

Regarding **claims 8, 24, 34 and 41**, Bergstrom further discloses a method and apparatus wherein said first set of parameters comprises pitch of said voiced portion of said input speech (pitch; column 6, lines 29-66).

Regarding **claims 9, 25, 35 and 42**, Bergstrom further discloses a method and apparatus wherein said first set of parameters comprises excitation of said voiced portion of said input speech (excitation; column 6, lines 29-66 and column 8, lines 19-26).

Regarding **claims 10, 26, 36 and 43**, Bergstrom further discloses a method and apparatus wherein said first set of parameters comprises energy of said voiced portion of said input speech (energy; column 8, lines 19-26).

Regarding **claims 11 and 27**, Bergstrom further discloses a method and apparatus wherein said second set of parameters comprises characteristics of a voicing index of said input speech (index; column 6, lines 29-66 and column 7, lines 22-53).

Regarding **claims 13 and 29**, Bergstrom further discloses a method and apparatus wherein said decoder device uses said information regarding said first set of parameters to synthesize said voiced portion of said input speech (synthesized speech; column 4, lines 6-13).

Regarding **claims 15 and 31**, Bergstrom further discloses a method and apparatus wherein said decoder device uses said information regarding said second set of parameters to synthesize said noise portion of said input speech (synthesized speech; column 4, lines 6-13).

Regarding **claims 33 and 40**, it is interpreted and rejected for the same reasons as set forth in claims 1 and 17. In addition, Bergstrom further discloses an apparatus and method for synthesizing speech comprising:

a first module for obtaining a first set of parameters regarding a voiced portion of an input speech signal (input speech; column 3, line 63 – column 4, line 24);

a second module for obtaining a second set of parameters regarding a noise portion of said input speech signal (noise; column 20, lines 1-33);

a third module for synthesizing said voiced portion of said input speech signal from said first set of parameters approach (analysis and synthesis processor; column 3, line 63 – column 4, line 24);

a fourth module for synthesizing said noise portion of said input speech signal from said second set of parameters (noise; column 20, lines 1-33; and

a fifth module for combining said synthesized voiced portion and said synthesized noise portion to produce a synthesized version of said input speech (synthesize; column 4, lines 6-24), but does not specifically teach decomposing said input speech into a voiced portion and a noise portion using an adaptive separation component.

Andersen teaches audio signal processing using CELP comprising decomposing said input speech into a voiced portion and a noise portion using an adaptive separation component (separate voiced/unvoiced; columns 1-2, paragraphs 0019-0022), to increase the coding gain.

Regarding **claims 39 and 46**, it is interpreted and rejected for the same reasons as set forth in claims 1 and 17. In addition, Zinser further teaches a speech processing method and apparatus wherein said synthesized noise portion is estimated (estimated; column 2, lines 22-34 and column 3, lines 16-32).

Regarding **claims 48, 51, 53 and 55**, it is interpreted and rejected for the same reasons as set forth in claims 1 and 17. In addition, Zinser further teaches a speech processing method and apparatus wherein said filter cut-off frequency (cut off frequency) is communicated to said decoder using a plurality of bits in said voicing

index (voiced) to indication to said decoder which filter to use for said signal decomposition (abstract, column 2, lines 22-34 and column 3, lines 16-32 with column 12, line 24 – column 13, line 2).

5. **Claims 2 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergstrom in view of Andersen, Zinser and Tucker and in further view of Accardi et al. (PGPUB 20054/0055219), hereinafter referenced as Accardi.

Regarding **claims 2 and 18**, Bergstrom in view of Andersen, Zinser and Tucker disclose a method and apparatus for signal and decomposition of voiced speech, but does not specifically teach comprising removing said background noise from said input wideband speech signal before decomposing said input wideband speech signal into said voiced portion and said noisy portion.

Accardi discloses a method and apparatus comprising removing said background noise from said input wideband speech signal before decomposing said input wideband speech signal determining excitation after determining the speech and noise part) into said voiced portion and said noisy portion (figure 3 with paragraphs 0014 and 0025-38), for speech enhancement.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bergstrom in view of Andersen, Zinser and Tucker's method and apparatus, as described above, to generate a robust and flexible

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speech enhancement and coding process that exhibits better performance (paragraph 0042).

6. **Claims 6 and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergstrom in view of Andersen Zinser and Tucker and in further view of Gigi (USPN 6,453,283).

Regarding **claims 6 and 22**, Bergstrom in view of Andersen, Zinser and Tucker disclose a method and apparatus for processing speech, but does not specifically teach wherein said characteristic of said input speech is gender of a person uttering said input speech.

Gigi teaches a speech processing method and apparatus wherein said characteristic of said input speech is gender of a person uttering said input speech (speech preferably is sex-specific; column 12, lines 23-45), to improve the overall quality.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bergstrom in view of Andersen, Zinser and Tucker's method and apparatus, as taught by Gigi, to enable the production of more natural speech (column 1, lines 65-67).

7. **Claims 49, 52, 54 and 56** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergstrom in view of Andersen, Zinser and Tucker, and in further view of Li et al. (PGPUB 2007/0110042), hereinafter referenced as Li.

Regarding claims **49, 52, 54 and 56**, Bergstrom in view of Andersen, Zinser and Tucker disclose a method and apparatus for processing speech, but do not specifically teach wherein said voicing index defines a plurality of low pass filters.

Li discloses a speech processing method and apparatus wherein said voicing index defines a plurality of low pass filters (column 22, paragraphs 0250-0251 with column 27, paragraphs 0280-0281), to optimize the performance.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bergstrom in view of Andersen, Zinser and Tucker's method and apparatus wherein said voicing index defines a plurality of low pass filters, as taught by Li, to multiply the down-sampled signal by cosine and sine, which optimizes the performance (column 22, paragraphs 0250-0251).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Goldberg et al. (USPN 5,706,392) disclose a perceptual speech coder and method.

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- Kelliher et al. (PGPUB 2004/0153544) disclose a universal broadband server system and method.
- Jax et al. (PGPUB 2003/0050786) disclose a method and apparatus for synthetic widening of the bandwidth of voice signals.
- Tokuda (PGPUB 2002/0016698) discloses a device and method for audio frequency range expansion.
- Miet et al. (USPN 6,681,202) disclose a wide band synthesis through extension matrix.
- LeBlanc et al. (USPN 7,283,585) disclose a split-band multiple data rate communication system.
- Paksoy et al. (PGPUB 2002/0052738) disclose a split-band speech coding system and method
- Drogo de Jacovo et al. disclose some experiments of 7 kHz split-band coding at 16 kbit/s.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAKIEDA R. JACKSON whose telephone number is (571)272-7619. The examiner can normally be reached on Monday-Friday from 5:30am-2:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571-272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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JRJ

July 29, 2008

/Talivaldis Ivars Smits/
Primary Examiner, Art Unit 2626